

OTTER CREEK RESERVOIR



Introduction

Otter Creek Reservoir is at the south end of Grass Valley, east of Circleville and south of Koosharem. It is a large, shallow impoundment of a low elevation valley.

The reservoir shoreline is publicly and privately owned. The public portion is administered by the Bureau of Land Management and Utah State Parks and Recreation.

Public access is restricted to the south and west sides.

Defined beneficial uses include: water recreation excluding swimming, propagation of cold water fish and aquatic life, and agricultural needs.

Recreation

Otter Creek Reservoir is directly accessible from U-62 between Koosharem and Junction. The reservoir is 31 miles south of the U-24/U-62 junction near Koosharem and 12 miles east of the US-89/U-62 junction near Junction, Utah.

Fishing is excellent for rainbow trout. Waterskiing, swimming, picnicking and camping are also possible. Usage is moderate.

Otter Creek State Park, located at the south end of the lake, has complete recreational facilities, including 24

Characteristics and Morphometry

Lake elevation (meters / feet)	1,942 / 6,372
Surface area (hectares / acres)	1,020 / 2,520
Watershed area (hectares / acres)	281,000 / 694,000
Volume (m ³ / acre-feet)	
capacity	64,752,682 / 52,495
conservation pool	0
Annual inflow (m ³ / acre-feet)	
Retention time (years)	
Drawdown (m ³ / acre-feet)	41,434,562 / 33,591
Depth (meters / feet)	
maximum	11.3 / 37
mean	6.3 / 20.6
Length (km / miles)	10.5 / 6.55
Width (meters / feet)	1,170 / 3,854
Shoreline (km / miles)	27.3 / 16.9

Location

County	Piute
Longitude / Latitude	111 59 17 / 38 12 52
USGS Map Angle, Utah	1970, Phenolite Hill, Utah
DeLorme's Utah Atlas & Gazetteer™	Page 27, B-4
Cataloging Unit	Otter Creek (16030002)

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campsites with flush toilets, showers, an improved public boat ramp, picnic areas and a swimming area. The State Park is open year around. In addition there are private facilities in the area. The low elevation and consequent sagebrush vegetation, however, result in a lack of traditional scenic beauty. There are no other public campgrounds in the area.



Otter Creek R.V. Park and Marina, a private resort has full hookup RV sites, cabins, boat launching facilities and non-motorized boats for rent, a laundromat, showers, and flush toilets.

Watershed Description

The reservoir is in the south end of Grass Valley, between the Fish Lake Plateau and the Sevier Plateau. Otter Creek Reservoir impounds Otter Creek and receives supplementary water from the East Fork Sevier River via the East Fork Canal.

Grass Valley is a long, broad valley between the Awapa Plateau and the Sevier Plateau. Parker Mountain, the 20 mile long uninterrupted 3,000' tall face of the Awapa Plateau, provides a stunning backdrop for Otter Creek Reservoir. The area immediately surrounding the reservoir is lacking in traditional scenic beauty, being a sagebrush rangeland.

The watershed high point, The Fish Lake Hightop Plateau, is 3,546 m (11,633 ft) above sea level, thereby developing a complex slope of 3.6% to the reservoir. The inflows are Otter Creek and East Fork Canal. Koosharem Reservoir is an upstream impoundment on Otter Creek and Tropic Reservoir is an upstream impoundment on the East Fork Sevier River. The outflow is a canal that drains into the East Fork Sevier River. The average stream gradient in the Otter Creek Drainage is 2.1% (109 feet per mile) and 0.8% (45 feet per mile) in the East Fork Sevier drainage.

The soil in the surrounding high country is derived from the underlying volcanic rocks. The soil in the vicinity

of the reservoir is made up of alluvial deposits from the high country. The soil associations that compose the watershed are listed in Appendix III.

The vegetation communities are comprised of bitterbrush, mountain mahogany, pinion-juniper, sage-grass, pine, aspen, spruce-fir, oak and maple. The watershed receives 25 - 64 cm (10 - 25 inches) of precipitation annually with a frost-free season of 80 - 100 days at the reservoir.

Land use in the Otter Creek and in the East Fork Sevier River watershed is 97.2% and 96% multiple use respectively. The primary use is grazing with approximately 2% in each watershed for pasture and hayland. There is about 2% in the Otter Creek drainage in crop production. The shoreline is 50% privately owned and 50% BLM owned. Public accessibility is restricted to the south and west shores.

Limnological Assessment

Limnological Data

Data averaged from STORET sites: 494922, 494923, 494929

Surface Data	1979**	1990**	1992
Trophic Status	E	E	M
Chlorophyll TSI	54.72	39.97	30.21
Secchi Depth TSI	44.17	57.37	45.99
Phosphorous TSI	66.88	74.98	54.41
Average TSI	55.29	57.44	43.53
Chlorophyll <i>a</i> (ug/L)	11.7*	2.7	0.9
Transparency (m)	3	1	2.7
Total Phosphorous (ug/L)	77.5	136	45
pH	8.6	8.5	9.3
Total Susp. Solids (mg/L)	-	6.5	<3
Total Volatile Solids (mg/L)	-	-	0
Total Residual Solids (mg/L)	-	-	3
Temperature (°C / °f)	15/59	21/71	19/67
Conductivity (umhos.cm)	373	435	338

Water Column Data

Ammonia (mg/L)	0.07	0.03	0.03
Nitrate/Nitrite (mg/L)	0.16	-	0.01
Hardness (mg/L)	172	185	139
Alkalinity (mg/L)	175	176	139
Silica (mg/L)	26.2	-	20.4
Total Phosphorous (ug/L)	81	149	56

Miscellaneous Data

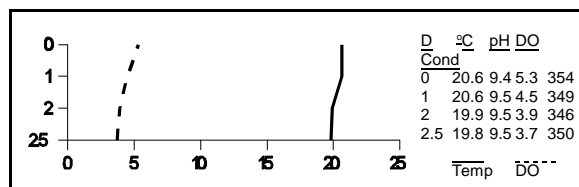
Limiting Nutrient	N	N	N
DO (Mg/l) at 75% depth	5.9	6	3.9
Stratification (m)	NO	1-2	NO
Depth at Deepest Site (m)	10	3.0	2.5

* NES data.

** Data from 2 sites only (494922, 4949000).

*** Data is from period two only.

LAKE REPORTS



The water quality of Otter Creek Reservoir is fair to good. It is considered to be moderately hard with a hardness concentration value of approximately 163 mg/L (CaCO₃). Those parameters that have exceeded State water quality standards for defined beneficial uses are total phosphorus, pH and dissolved oxygen. The average concentration of total phosphorus in the water column for the three study periods was 81, 149 and 56 ug/L. All values exceed the recommended pollution indicator for phosphorus of 25 ug/L. The phosphorus concentration appears to be declining which may be due to environmental remediation programs that have been implemented in recent years. Excessive pH values greater than 9.0 are probably due to the high production of algae and macrophytes in the system. During the photosynthetic process pH values are naturally elevated. Low dissolved oxygen conditions develop due to the increased demand for oxygen in decomposition of organic materials at the bottom of the reservoir and the consumption of oxygen by plants during respiration.

The reservoir does not usually stratify because of summer drawdown which leads to shallow conditions not conducive for stratification as indicated in the August 19, 1992 profile. Dissolved oxygen concentrations in late summer do substantiate the fact that water quality impairments do exist. Concentrations can drop dramatically during the nocturnal period due to the high demand from plant respiration. These types of conditions can lead to fish kills when shallow conditions and high productivity are combined.

Current data suggest that the reservoir is currently a nitrogen limited system and TSI values indicate the reservoir is usually eutrophic but in 1992 was mesotrophic. The productivity appears to be abnormally low in 1992. Low water years may be masking the productivity by limiting nutrient loadings.

Due to the impaired water quality of the reservoir in recent years, a Clean Lakes Phase I study was initiated. The purpose of the study is to assess impairments and to develop a feasibility plan to control sources of nutrients in the watershed. In recent years the high level of nutrients not only drives the production of large blue-green algal blooms but the production of macrophytes in the reservoir. Macrophyte production is so extensive that it restricts boating and impairs the fishery. This high state of production and the reservoirs shallow nature are

responsible for depletion of dissolved oxygen in the water column. This depletion results from the loss of dissolved oxygen in the summer due to the heavy needs by the algal community involved in respiration during the nocturnal period and the loss experienced to the decomposition of organic matter (algae and macrophytes). These conditions can become more severe during the winter under ice coverage. These conditions reduce the viability of the fishery by reducing the available habitat for fish. A report from that study is currently being drafted and review by agencies and individuals involved in the study area. The report will be available through the DWQ.

According to DWR no fish kills have been reported in recent years, but there are documented limited fish kills historically. The reservoir supports populations of rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*), cutthroat trout (*Oncorhynchus clarki*), Utah chub (*Gila atraria*), and Utah sucker (*Catostomus ardens*). Current stocking reports indicate that DWR stocked the reservoir with 200,000 6-8" rainbow trout and 25,000 fingerling cutthroat trout in 1991.

Phytoplankton in the euphotic zone include the following taxa (in order of dominance)

Species	Cell Volume (mm ³ /liter)	% Density By Volume
<i>Ceratium hirundinella</i>	0.936	73.86
Pennate diatoms	0.289	22.81
Centric diatoms	0.027	2.11
<i>Oscillatoria princeps</i>	0.006	0.44
Unknown spherical green alga	0.006	0.44
<i>Ankya judayi</i>	0.004	0.34

Information

Management Agencies

Utah Parks and Recreation	538-7221
Otter Creek State Park	624-3268
Bureau of Land Management	539-4001
Sevier River Resource Area (Richfield Office)	896-8228
Six County Commissioners Association	
Division of Wildlife Resources	538-4700
Division of Water Quality	538-6146

Recreation

Otter Creek R.V. Park and Marina	624-3292
Panoramaland Travel Region (Richfield)	896-9222

Reservoir Administrators

Otter Creek Reservoir Company	896-5217
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Total	0.000
Shannon-Weaver [H']	0.71
Species Evenness	0.40
Species Richness	0.24

The phytoplankton community is dominated by the presence of flagellates and diatoms indicative of fairly good water and moderate productivity as was the case in 1992.

Pollution Assessment

Nonpoint sources of pollution in the reservoir include: sedimentation and nutrient loading from grazing in the watershed and in the vicinity of the reservoir; pesticides and fertilizers from cultivated cropland; and wastes or litter from recreation.

There are two point pollution sources in the watershed, Burrville and Deans Fish Hatcheries..

Beneficial Use Classification

The state beneficial use classifications include: boating and similar recreation (excluding swimming) (2B), cold water game fish and organisms in their food chain (3A) and agricultural uses (4).